

Investigating the Influence of Glaucoma on the Quality of Life among Adult Patients

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Abstract

Background: Research exploring the influence of glaucoma on quality of life has gained momentum in recent years. Numerous studies have investigated the multifaceted aspects of quality of life in glaucoma patients, utilizing various assessment tools and methodologies. **Objective:** To determine the influence that glaucoma has on the quality of life among adult patients. **Study site:** kitwe teaching eye hospital, Zambia. **Method:** It was a cross-sectional study that was conducted from 30th June 2022 to 17th April 2023. The study included 106 diagnosed glaucoma patients who were above the age of 55 years. Data was collected using validated 25-item national eye institute visual function Questionnaire (NEI VFQ-25). The data was analyzed using SPSS version 26 and Microsoft excel to present frequencies and percentages that generated graphical presentation. **Results:** 62% of the participants worry about their eye sight most of the time, 26% sometimes and 12% a little time. 9% of the participants had little difficulty to read ordinary prints, 14% moderate difficulties and 58% extremely difficult. 40% of the participants could drive despite glaucoma damaging their eyes while 60% could not. Majority of the patients said it was difficult noticing things around them while walking or sitted in one place. There was a significant difference between effects of glaucoma on patients and the existing relationship between glaucoma and quality of life (ANOVA, $p = 0.019$ and ANOVA, $p = 0.023$). **Conclusion:** This study has demonstrated the magnitude of impact that glaucoma has on the Quality of Life (QoL) in diagnosed patients and the relationship between glaucoma and the Quality of Life. Due to the progressive visual loss, the amount of activities these patients would perform is negatively affected especially where social and economic activities are concerned which also affects their monthly earnings for those living in middle to low-income countries. Therefore, social welfare and psycho-social institutions need to increase their support for these glaucoma patients.

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Keywords

Glaucoma, Quality of Life, Glaucoma Patients

1. Introduction

Glaucoma is a chronic eye disease that affects the optic nerve, leading to progressive vision loss, and if left untreated, can eventually result in blindness [1] [2] [3]. It is one of the leading causes of irreversible visual impairment worldwide affecting millions of individuals across different age groups [4] [5] [6]. As the global population continues to age, the prevalence of glaucoma is expected to rise, posing significant challenges for healthcare systems [7] [8] [9] [10].

A study was conducted on the effects of glaucoma medication on dry eye syndrome and quality of life in patients with glaucoma, they found that there were significant differences in near work daily activities and social functioning between the control normal participants group and glaucoma patients group who were on medication [11]. However, this study only focused on the near work activity aspect of the quality of life and overlooked other aspects which are as well very much affected in the individuals suffering from this disease. Also the study did not specify the age group of the participants and it focused more on the drug therapeutics side effects on participants than the social economic factors.

Another study was done in Ethiopia on vision-related quality of life and associated factors among an adult Population with glaucoma attending a comprehensive specialized hospital concluded that the vision-related quality of life was significantly associated with educational status, visual acuity of the better and worse eye as well as stage of glaucoma in the better eye [12]. However, the gap in this study was that it only looked at the quality of life in glaucoma patients with regard to their educational status, visual acuity and glaucoma stage but disregarded other aspects like financial status of the affected patients.

While the primary clinical focus of glaucoma research has traditionally been on the progression of the disease and its management, there is growing recognition of the impact of glaucoma on the quality of life (QoL) of affected individuals [13] [14] [15]. Quality of life encompasses various aspects, including physical, psychological, social, and emotional well-being [16]. Understanding how glaucoma influences the QoL of patients is crucial for optimizing their care, addressing their specific needs, and improving their overall treatment outcomes.

Patients have to use one or more eye drops more than once a day which brings about issues to do with adherence [17] [18]. Therapies such as effective laser trabeculoplasty and glaucoma surgery may eliminate or reduce the need for glaucoma medications thereby curbing the problem of daily medication compliance [19]. However, this treatment modality is not cheap and many patients cannot afford to pay for it thereby posing a major threat on the patient's QoL as most patients diagnosed with glaucoma are above the age 55 years and near to or

already retired by then with limited income to sustain their daily needs [20] [21] [22]. Therefore, this study conducted at kitwe teaching eye hospital in Zambia focused on finding out the influence that glaucoma has on the quality of life of adult patients above the age of 55 years.

2. Materials and Methods

This was a cross-sectional study which included 106 participants and focusing on the subject matter of glaucoma, particularly on how it influences the patients' quality of life in patients above the age of 55 years. Informed consent was obtained from all the participants before they could be recruited in the study in accordance with Helsinki declaration. The data involved glaucoma patients who visited the hospital from 30th June, 2022 to 17th April, 2023. This study employed a structured questionnaire to collect primary data from the respondents. Vision-Related Quality of Life was assessed using the validated 25-item National Eye Institute Visual Function Questionnaire (NEI VFQ-25) developed by researchers at the National Eye Institute (NEI), which is part of the National Institutes of Health (NIH) in the United States and the validity and reliability of the questionnaire was tested in conducting this research. The variables which were investigated in this study included the type of community patient was coming from, gender, number of years lived with glaucoma, who they lived with, monthly income, extent of worry about eye sight, difficulties in visiting with people, whether driving or not, if driving any difficulties with sight, any difficult to read ordinary prints, any difficulties finding things on shelves, noticing objects on the sides and road signs as well as any difficulties in picking matching colours for special dress codes.

Inclusion and Exclusion criteria

The following criteria was used to determine inclusion: 1) Patients above the age of 55 years, 2) patients with a definitive diagnosis of glaucoma, 3) patients with best corrected visual acuity of 6/18 and worse who visited the hospital from 30th June, 2022 to 17th April, 2023.

The following were the exclusion criteria: 1) known glaucoma patients but have other ocular conditions that may affect best corrected visual acuity, 2) Patients with insufficient medical data, 3) patients below the age of 55 years, 4) Patients with a history of glaucoma surgery.

Purposive sampling technique was used in selecting respondents for the questionnaires. The rationale for employing this type of sampling technique was based on the idea that the selected respondents meet the inclusion criteria characteristics.

To find the minimum sample size for this study, Slovin's Formula was used whose formula is shown below:

$$n = N / (1 + Ne^2)$$

where

n = sample size;

N = Population size;

e = margin of error = 0.05.

The population of 144 patients were monthly cases seen at Kitwe Teaching Eye Hospital. Therefore, the sample size will be;

$$144/(1 + 144 * 0.0025) = 105.8823529 = (106)$$

Visual acuity and visual field was used to characterize the patients to be included in the study. The data was analyzed using SPSS version 26 and Microsoft excel to present frequencies and percentages that generated graphical presentation.

3. Results

A total of 106 patients were included in this study, all those patients that did not meet the inclusion criteria were left out. These included glaucoma diagnosed patients were asked to provide responses in various ways in which glaucoma affected their quality of life with regard to their socio-economic status. 33% of the participants were coming from the rural areas while 67% of them were from the urban communities, of which 57% were male and 43% were female. 34% of the participants had glaucoma for less than 5 years while 66% of them had lived with it for more than five years. 60% of the participants survive on less than \$200 USD per month, 23% between \$200 - \$400 USD and finally 17% above \$400 USD per month (**Table 1**). 36 out of 106 participants suffered from Chronic angle closure glaucoma, 20 from Pseudoexfoliation glaucoma and finally 70 suffered from Primary open angle glaucoma (**Figure 1**). The study found that 16 out of 106 participants had visual acuity of less than <20/200, 30 had between 20/125 to 20/200, 40 had between 20/80 to 20/125 and 20 had 20/50 to 20/80 (**Figure 2**). 62% of the participants were worried about the eye sight and majority of them could not drive their cars in both day and night time due to progressively depleting vision (**Table 2**). The study further revealed that 9% of the participants had little difficulty to read, 14% had moderate difficulties and 58% found it extremely difficult to read ordinary print. However, 2% of them had never faced difficulties in reading while on the other hand 16% had stopped reading because of their eyesight. The table further shows that 10% of the participants found it a little difficulty to find something on a crowded shelf, 11% found it moderately difficulty, 72% had extreme difficulties, 7% faced no difficulty at all to find something on a shelf. In the same table results, 12% of the participants showed that it was a little difficulty to notice the objects off their side while walking, 67% revealed that it was extremely difficulty and 21% demonstrated that it was moderately difficulty to notice objects while walking. In the same vain, 11% demonstrated that it was a little difficulty to differentiate colors, 8% showed that it was moderately difficult while the majority which is 51% revealed that it was extremely difficulty to differentiate colors and 30% found no difficulty at all (**Table 3**).

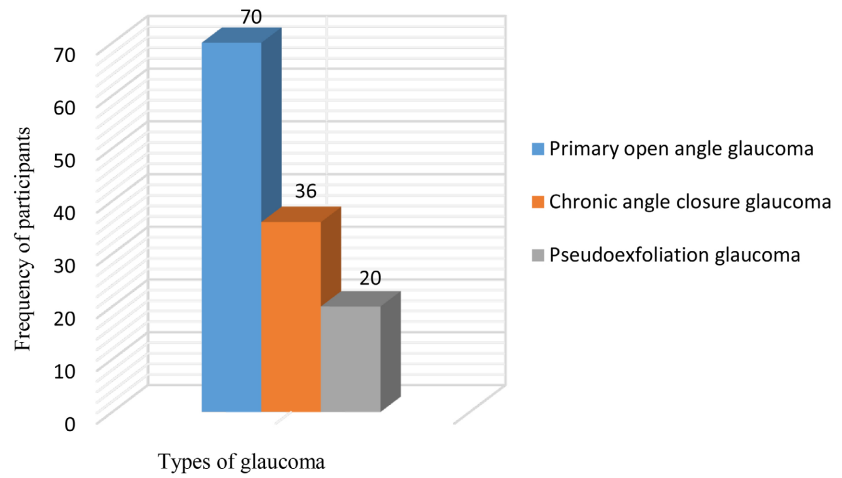


Figure 1. Types of glaucoma and participant frequency.

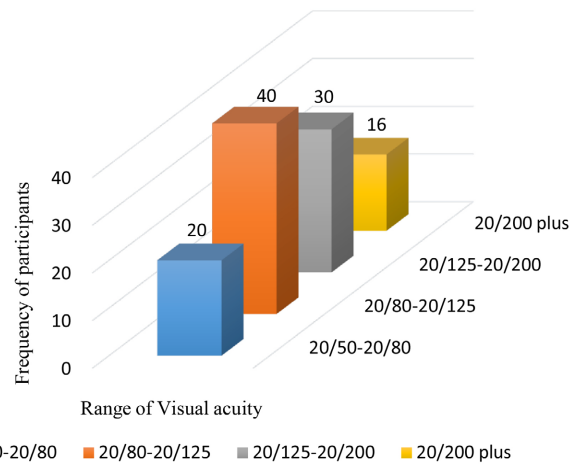


Figure 2. Visual Acuity of better eye and participant frequency.

Table 1. Shows social demographic characteristics of glaucoma patients.

Variable	Category	Frequency (n)	Percentage (%)
Type of community	Rural	35	33
	Urban	71	67
Gender	Male	60	57
	Female	46	43
Number of Years lived with Glaucoma	Less than 5 years	36	34
	More than 5 years	70	60
Who do you live with	Alone	21	20
	Spouse	45	42
	With family Members	40	38
Monthly Income	Less than \$200 USD	64	60
	Between \$200 to \$400 USD	24	23
	More than \$400 USD	18	17

Table 2. Existing relationship between glaucoma and quality of life.

Variable	Case (n = 106)	Percentage (%)
Worrying about eyesight.		
A little of the time:	13	12
Most of the time:	66	62
Some of the time:	27	26
Difficulties in visiting with people.		
Extreme difficulty:	58	55
Moderate difficulty:	14	13
No difficulty at all:	16	15
Stopped because of eyesight:	18	17
Currently driving.		
Yes:	42	40
No:	64	60
If currently driving, any difficulties driving during daytime.		
Extreme difficulty:	41	38
Moderate difficulty:	44	41
No difficulty at all:	21	21
Difficulty when driving at night.		
Extremely difficulty:	42	40
Moderate difficulty:	34	36
No difficulty at all:	30	24
Difficulty driving in bad conditions (bad weather, during rush hour, on the freeway, or in city traffic).		
Extremely difficulty:	42	40
Moderate difficulty:	36	38
No difficulty at all:	28	22

Table 3. Shows negative effects of glaucoma on patients daily activities.

Variable	Case (n = 106)	Percentage (%)
How much difficulty do you have reading ordinary print in newspapers?		
A little difficulty:	10	9
Extremely difficulty:	62	58
Moderately difficulty:	15	14
No difficulty at all:	2	2
Stopped because of eyesight:	17	16

Continued

Because of your eyesight, how much difficulty do you have finding something on a crowded shelf?		
A little difficulty:	11	10
Extremely difficulty:	76	72
Moderately difficulty:	12	11
No difficulty at all:	7	7
Because of your eyesight, how much difficulty do you have noticing objects off to the side while you are walking along?		
A little difficulty:	13	12
Extremely difficulty:	71	67
Moderately difficulty:	22	21
Because of your eyesight, how much difficulty do you have picking out and matching your own clothes?		
A little difficulty:	12	11
Extremely difficulty:	54	51
Moderately difficulty:	8	8
No difficulty at all:	21	20
Stopped because of eyesight:	11	10

4. Discussion

The World Health Organization (WHO) defines Quality of Life (QOL) as an “individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” [23]. A person’s Vision Related Quality of Life (VRQOL) is specifically concerned with his or her satisfaction with their vision function and how it impacts their daily lives [24]. we carried out this study to investigate the influence of glaucoma on the quality of life among adult patients, making it one of the few studies conducted around the globe looking specifically on this negative aspect of glaucoma.

Glaucoma is the leading cause of irreversible blindness worldwide. It is associated with a pathologically high intraocular pressure which negatively affects visual acuity and cause visual field defects [25]. The quality of life of patients with glaucoma is often affected by the impairment of visual function. According to the findings of this study, glaucoma patients had a significantly lower quality of life. Moreover, the majority were psychologically affected in terms of worry and because of that, the level of work input was largely affected as a consequence of poor vision which negatively affected their quality of Life. Thus, a segment of the population sampled had even stopped working [26]. Visual impairments are much more detrimental to reading skills and information access, slightly less detrimental to mobility and independence, and least detrimental to emotional well-being [27]. And the study agrees with our findings because a lot of partici-

pants (58%) had extreme difficulties reading ordinary prints despite being educated. Glaucoma patients are more likely to experience anxiety, depression and feelings of hopelessness about their future, and their self-reported health assessment is reduced [28]. This could be attributed to a number of factors because according to this study, most glaucoma patients are uncertain about the source of income to buy their medication as most of them (60%) earned less than \$200 per month and this makes them (66%) be worried most of the their life time thereby sending themselves into depression. There is a strong association between glaucoma and Vision related QoL [29] thus confirming that glaucoma patients have reduced vision related quality of life.

The study confirms having correlated to other studies that glaucoma causes a reduced Quality of Life (QoL) in terms of the patients' social life, their occupational lives and general quality of living. A good number of participants that owned cars did not find it easy to drive and see road signs and objects during day and night time respectively. Some participants in the study (76%) stated that they could not easily find things on the shelves in their houses and could not even pick matching clothes for their outfit with easy (54%). Thus all levels of visual impairment had a negative impact on the quality of life of glaucoma patients and have deteriorating as well as detrimental effects as observed. The functional vision determines the ability of an individual to perform vision dependent activities [30]. The degree of concentration depends on a number of factors including visual acuity, contrast sensitivity, and field of vision. By limiting an individual's functional vision and negatively affecting their sense of wellness, visual disability in glaucoma negatively affects the quality of life (QoL).

Glaucoma is among the most common causes of blindness in sub-Saharan Africa, accounting for 5.2% of total blindness and adversely affecting patients' quality of life. As a result, patients with glaucoma become functionally impaired when central vision is impinged upon or affected by visual field loss [31].

As observed in the findings, patients with glaucoma may have difficulty recognizing faces, navigating, reading, viewing television, and adjusting to different levels of lighting as a result of their disease.

Most of the sampled patients with glaucoma 94.34% become limited in the kind of work or activities they would like to do because of moderate to severe visual impairment with primary open angle glaucoma being the most frequent type among adults diagnosed with glaucoma. Studies have shown that there is a positive correlation between quality of life and glaucoma patients.

5. Conclusion

This study has demonstrated the magnitude of impact that glaucoma has on the Quality of Life (QoL) in diagnosed patients and the relationship between glaucoma and the Quality of Life. Glaucoma negatively affects many facets of the patient's life once diagnosed with it. Due to the progressive visual loss, the amount of activities these patients would perform is negatively affected especially where social and economic activities are concerned which also affects their monthly

earnings for those living in middle to low-income countries. Therefore, social welfare and psycho-social institutions need to increase their support for these glaucoma patients.

6. Study Limitations

The limitation to this study was that the sample size was small and only collected from one single hospital in addition to the duration of study being short. There is a need for a bigger sample size from more than one hospital with a prolonged duration of study in future research for the most reliable and unbiased findings.

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Patient Consent and Ethics Approval

Consent was obtained from all the patients before being recruited into the study and ethical approval done by Mulungushi university ethics committee.

Disclosure Statement

The authors have no financial or proprietary interest in any material or method mentioned.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authorship

Authors attest that they meet the current ICMJE criteria for authorship.

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Appendix: Questionnaire

Dear Respondent:

You have been picked randomly via the use of probability sampling techniques to participate in this research project and your full participation will be highly appreciated. The findings generated in this study will be handled with the highest level of confidentiality and for this academic exercise only.

Please respond to the following questions as truthfully as possible. Where there are, options provided, select the appropriate response by putting a tick [✓] in the box of your choice, and write the answer in the space provided

Part 1: Demographic characteristics of participants Provide information about yourself by ticking (✓)

1) What type of community do you live in?

a) Rural

b) Urban

2) Gender

a) Female

b) Male

3) Age

a) Above 55 years

b) Less than 55 years

4) Number of years lived with glaucoma

a) Less than 5 years

b) More than 5 years

5) Who do you live with?

a) Alone

b) Spouse

c) With family Members

6) Monthly Income

a) Less than \$200 USD

b) Between \$200 to \$400 USD

c) More than \$400 USD

7) Worrying about eyesight.

a) A little of the time:

b) Most of the time:

c) Some of the time:

8) Difficulties in visiting with people.

a) Extreme difficulty:

b) Moderate difficulty:

c) No difficulty at all:

d) Stopped because of eyesight

9) Currently driving.

a) Yes:

b) No:

- 10) If currently driving, any difficulties driving during daytime.
- a) Extreme difficulty:
 - b) Moderate difficulty:
 - c) No difficulty at all:
- 11) Difficulty when driving at night.
- a) Extremely difficulty:
 - b) Moderate difficulty:
 - c) No difficulty at all:
- 12) Difficulty driving in bad conditions (bad weather, during rush hour, on the freeway, or in city traffic).
- a) Extremely difficulty:
 - b) Moderate difficulty:
 - c) No difficulty at all:
- 13) How much difficulty do you have reading ordinary print in newspapers?
- a) A little difficulty:
 - b) Extremely difficulty:
 - c) Moderately difficulty:
 - d) No difficulty at all
 - e) Stopped because of eyesight:
- 14) Because of your eyesight, how much difficulty do you have finding something on a crowded shelf?
- a) A little difficulty:
 - b) Extremely difficulty:
 - c) Moderately difficulty:
 - d) No difficulty at all:
- 15) Because of your eyesight, how much difficulty do you have noticing objects off to the side while you are walking along?
- a) A little difficulty:
 - b) Extremely difficulty:
 - c) Moderately difficulty
- 16) Because of your eyesight, how much difficulty do you have picking out and matching your own clothes?
- a) A little difficulty:
 - b) Extremely difficulty:
 - c) Moderately difficulty:
 - d) No difficulty at all
 - e) Stopped because of eyesight: